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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/574,837	04/06/2006	Mitsuhiro Horio	P29478	5021
7055 7590 12/01/2009 GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191				
EXAMINER LACLAIR, DARCY D				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
12/01/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com
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Office Action Summary

Application No.

10/574,837

Applicant(s)

HORIO ET AL.

Examiner

Darcy D. LaClair

Art Unit

1796

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 September 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5,7-10,12 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5,7-10,12 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **9/18/2009** has been entered.

All outstanding rejections, except for those maintained below are withdrawn in light of the amendment filed on **9/18/2009**.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

2. **Claim 1** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, Claim 1 recites "wherein the content of aromatic vinyl compound units in polymer block B1 is at least 90% by weight, wherein the content of aromatic vinyl compound units in the polymer block B2 is less than 90% by weight and not less than 3% by weight, and wherein the content of aromatic vinyl compound units ranges from 62 to 90% by weight." It is not understood what the third portion of this quotation

refers to; specifically, the content of aromatic vinyl compound units ranging from 62% to 90% by weight in what? The entire block copolymer? Block B1? Block B2? In the interest of compact prosecution, the claim will be treated as though this describes the content of the entire block copolymer, as the content of the other two portions is already described, and a this definition of the respective blocks would conflict with the definitions already set forth in Claim 1.

Claim Rejections - 35 USC § 103

3. **Claims 1-5, 7-10 and 12-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Doki et al. (US 2002/0115790)** in view of **Shibata et al. (US 5,191,024)**.

The rejection is adequately set forth in **paragraph 4** of the office action mailed **12/10/2008** and in **paragraph 2** of the office action mailed **5/21/2009**, and is incorporated here by reference.

With regard to the amendment to Claim 1, Shibata teaches a content of aromatic vinyl from 5 to 60%. Although Shibata's 60% is not exactly the 62% required by applicant, it is the examiner's position that the values are close enough that one of ordinary skill in the art would have expected the same properties. Case law holds that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

4. **Claims 1-5, 7-10 and 12-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Doki et al. (US 2002/0115790)** in view of **Hubbard et al. (US 6,521,704)**.

It is noted that **Claim 1**, with respect to the ethylenic unsaturated groups of polybutadiene portions hydrogenated after random polymerization of the aromatic vinyl compound with the conjugated diene compound,=, is stated in product by process format.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

Absent showing of criticality, the process limitations in a product-by-process claim do not carry patentable weight. Nevertheless as this process is taught by Shibata, it is clarified below.

It is noted that the polyolefin is not required in Claim 1, however as Doki meets this limitation, it is set forth below.

With regard to Claim 1, Doki teaches a polyoxymethylene resin composition which comprises **(I)** 100 parts by weight of a polyoxymethylene polymer, **(II)** 1-200 parts by weight of a thermoplastic elastomer with the main dispersion peak temperature of -30°C to 50°C, (see abstract, par [0007]) and **(III)** 1 - 100 parts by weight of a polyolefinic resin. (See par [0008])

Doki teaches that the preferred thermoplastic elastomer (II) comprises a vinyl aromatic monomer segment and a segment having a diene monomer containing such as butadiene, isoprene, and the like, copolymerizable with the styrene monomer, preferably with at least two polymer segments (or blocks) of the vinyl aromatic type. (See par [0032]-[0034]) Doki further exemplifies a block copolymer which has been hydrogenated (see par [0093]) This copolymer provides vibration damping properties to the composition. Doki does not explicitly teach a block copolymer specifically having a randomly copolymerized block comprising hydrogenated aromatic vinyl and diene or specific percents of the aromatic vinyl compound in each block or in the overall copolymer.

Hubbard teaches a block copolymer for use in a polymer system to improve dampening characteristics of a composition where the block copolymer comprises at least one block derived from aromatic vinyl units, and one block derived from isoprene and vinyl aromatic monomers, and optionally butadiene. (See abstract) The polymer systems include polyphenylene ethers and polyolefins (see col 3 line 58), such as that taught by Doki. The first block are aromatic vinyl monomers such as styrene (see col 4 line 4-10), which is consistent with a block having entirely (100%) aromatic vinyl units. The second component has polymerizable aromatic vinyl monomers in combination with isoprene-butadiene, and has a peak temperature of the tan delta not less than 25°C to obtain good dampening. (See col 4 line 12-13) The aromatic vinyl-diene block is preferably prepared by random polymerization, (see col 4 line 58) and the polymer can be hydrogenated according to the needs of heat resistance and weatherability. (See col

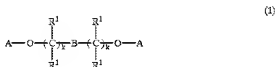
4 line 64-67) The weight ratio of the aromatic vinyl with isoprene-butadiene varies widely and can be determined by the skilled artisan, depending on the desired properties, however in one embodiment, the content of the aromatic vinyl monomer is up to about 40% by weight. (See col 4 line 27-55) The content of the aromatic vinyl block is from 5 to 50% by weight. If the content of the aromatic vinyl block is 50%, and the aromatic vinyl content of the aromatic vinyl-diene block is 40%, then the total content of aromatic vinyl for the block copolymer is up to 70%. This overlaps with applicant's instant requirements. Based on Doki's requirements for a hydrogenated block copolymer to provide dampening properties having aromatic vinyl and diene components, it would be obvious to incorporate the dampening copolymer of Hubbard, having aromatic vinyl and diene blocks designed specifically for systems such as a polyphenylene ether-polyolefin system.

With regard to Claim 2, Doki teaches 0.1 to 30 parts by weight of a lubricant, (see par [0008]) namely a silicone-grafted polyolefinic resin. (See par [0037])

With regard to Claim 3, Doki teaches 0.1 to 30 parts by weight of a lubricant. (See par [0008]) Doki also teaches other additives, including inorganic fillers such as glass fibers, talc, wollastonite and hydrotalcite, electrically conductive carbon black, pigments, and others. (see par [0048]) Doki is silent as to the percentage content of these inorganic fillers. Applicant has claimed a broad range which encompasses a range well known in the art for inorganic fillers, and addition of fillers is result dependant variable. Specifically, the content of filler will yield the desired property such as color, conductance, physical properties, processability, or the like. See MPEP § 2144.05 (B).

Case law holds that "discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art." See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With regard to Claims 4 and 9, Doki teaches a preferred polyoxymethylene block copolymer (i-2) with an average molecular weight of 10,000 – 500,000 represented by the formula



where A is



(Optionally with a terminal group ending in -O-H):



and B is a hydrogenated polybutadiene having 2-98 mole % 1,2-bonds and 2-98% 1,4 bonds being present in the polymer chain either in random or in blocks. Here, Doki's 1,2 bonds are the "m" group of the instant application, and Doki's 1,4 bonds are the "n" group of the instant application. (See Applicant's formula (1)) Doki's B group is identical to the T group, or "portion other than S" of the instant application. Here, A is a genus of the instant application's formula (2), with the form containing an optional terminal group representing the same species. Doki's R1 corresponds to the instant application's "R" and is be hydrogen, alkyl groups, substituted alkyl groups, aryl groups

and substituted aryl groups. Doki's R2 corresponds to the instant application's "R1" and is be hydrogen, alkyl groups, substituted alkyl groups, aryl groups and substituted aryl groups. Further comparison may be made in column 1, paragraph 14-18, however the essence is that these two polymers are of overlapping scope.

With regard to Claims 5 and 10, Doki teaches that the second group of the polyoxymethylene (i-1) has oxymethylene groups as the main recurring unit and contains an oxyalkylene group of 2 or more carbon atoms in an amount of 0.1 to 5 mole%. (See par [0013]) Doki further teaches that the ratio of i-1 (corresponding to A-2) to i-2 (corresponding to A-1) is in the range 0/100 to 95/5. This corresponds to a ratio of 0.05 to 100 of A-1/A-2. (See par [0018]) This closely encompasses the range recited by applicant.

With regard to Claims 7 and 12, Doki teaches generally that a variety of polyolefinic resins are available and can be modified with unsaturated carboxylic acids. (See par [0044]) Specifically, Doki exemplifies a maleic anhydride modified ethylene-butene copolymer as the polyolefinic resin. (See par [0103])

With regard to Claims 8 and 13, Doki indicates that the moldings are made from the resin, and the moldings can be further shaped by cutting. (See par [0050])

5. **Claims 1-5, 7-10 and 12-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Doki et al. (US 2002/0115790)** in view of **Hubbard et al. (US 6,521,704)** and **Sasagawa et al. (WO 03/0305705)**

It is noted that the international Patent Application WO publication is being utilized for date purposes. However, since **WO 03/035705** is in Japanese, in the discussion below, the US equivalent for **WO 03/035705**, namely **US 2004/0039128**, respectively, is referred to in the body of the rejection below. All column and line citations are to the US equivalent.

The discussion of **Doki** and **Hubbard**, above in **paragraph 4**, is incorporated here by reference.

With regard to Claim 1, attention is first directed to the discussion of Claim 1, above in paragraph 4. **Doki** teaches a thermoplastic elastomer with the main dispersion peak temperature of -30°C to 50°C, (see abstract, par [0007] comprising a vinyl aromatic monomer segment and a segment having a diene monomer. (See par [0032]-[0034] **Hubbard** teaches a copolymer where the weight ratio of the aromatic vinyl with isoprene-butadiene varies widely and can be determined by the skilled artisan, depending on the desired properties, however in one embodiment, the content of the aromatic vinyl monomer is up to about 40% by weight. (See col 4 line 27-55) The content of the aromatic vinyl block is from 5 to 50% by weight. If the content of the aromatic vinyl block is 50%, and the aromatic vinyl content of the aromatic vinyl-diene block is 40%, then the total content of aromatic vinyl for the block copolymer is up to 70%. The combination of **Doki** and **Hubbard** does not explicitly teach a total content of aromatic vinyl compound above 62%. **Sasagawa** teaches a hydrogenated copolymer comprising conjugated diene monomer units and vinyl aromatic units. (See abstract) Where the vinyl aromatic content of the copolymer is more than 60% by weight to less

than 90% by weight, the hydrogenated block copolymer will exhibit excellent anti-blocking (handling) properties, and scratch resistance, as well as excellent flexibility and impact resistance. (See par [0066]) It would be obvious to one of ordinary skill in the art to employ the upper end of Hubbard's range in order to obtain good handling and good impact resistance along with the dampening properties conferred by the teachings of Hubbard alone, and to employ this improved copolymer in the composition of Doki.

With regard to Claims 2-5, 7-10, and 12-13, since the particular limitations involved are the same as the one described with regard to Doki and Hubbard above in paragraph 4, attention is drawn to the discussion of **Doki and Hubbard**, above.

Response to Arguments

6. Applicant's arguments filed **9/18/2009** have been fully considered. Specifically, applicant argues **(A)** Applicants maintain the points raised in the response filed under 37 C.F.R. 1.116 and submit that those points are sufficient to overcome the outstanding rejections; **(B)** Claim 1 has been amended to recite that "the content of aromatic vinyl compound units ranges from 62% to 90% by weight" rather than 50 to 90% by weight; Shibata discloses that the component (B) has the randomly copolymerized block with a content of aromatic vinyl from 5-60%, and preferably 7-40%; When the proportion of alkenyl aromatic compound is more than 60% by weight, the resulting hydrogenated diene block copolymer is resinous and does not give improvement in impact resistance; **(C)** The content of 63% to 90% provides unexpectedly good results, observed by comparing Examples 1 and 2 of the present specification and the additional

comparative Examples 1 and 2, presented in the Declaration submitted 9/18/2009, using aromatic vinyl units of 57% by weight (within Shibata). The examples using the lower content of aromatic vinyl compound result in a composition having poorer mechanical properties, oil resistance, and sliding properties than the examples of the present invention.

7. **With respect to argument (A)**, the points raised by applicant in the after final rejection have been discussed in the response mailed 8/10/2009, and that discussion is incorporated here by reference.

With respect to argument (B), applicant's arguments have been considered but are **not persuasive**. Shibata teaches a content of aromatic vinyl from 5 to 60%. Although Shibata's 60% is not exactly the 62% required by applicant, it is the examiner's position that the values are close enough that one of ordinary skill in the art would have expected the same properties. Case law holds that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985).

With respect to applicant's argument that the preferable composition has from 7-40% by weight, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ

278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize any content of aromatic vinyl up to around 60% given that Shibata teaches this.

With respect to argument (C), applicant's arguments have been considered but are **not persuasive**. The Declaration submitted 9/18/2009, hereafter the Inagaki Declaration, has been reviewed, however there are several deficiencies in the Inagaki Declaration which, when taken in combination, render it unpersuasive. First, the evidence shown by the declaration is not sufficient to outweigh the evidence supporting a prima facie case for obviousness and applicants have not met their burden of establishing that invention provides unexpected results. Specifically, there is no change noted in the tensile elongation. The change in the tensile strength, flexural strength, and sound dampening capability is small, and it is not clear whether these changes are statistically significant or not. Although there is a change noted in the flexural modulus and Izod impact strength, the teachings of Sasagawa, that the content of vinyl aromatic monomer in a copolymer has a direct effect on the properties of the properties such as flexibility and impact resistance (see par [0066]) provides a strong motivation to adjust the content of the vinyl aromatic monomer, sufficient to outweigh the alleged unexpected results. This suggests that an observable trend is present, and one of ordinary skill in the art would be able to optimize the results given the knowledge of the trend, taught by Sasagawa. With regard specifically to the disclosure of Shibata, applicant has shown an example at 57% and at 70% bonded styrene. Based on the results between the shown concentrations, the difference between a bonded styrene

content of 60% (shibata) and 62% (applicant), it is the examiner's position that these points would be sufficiently similar that one of ordinary skill in the art would expect similar results. The teachings of Sasagawa support this position.

Furthermore, the results presented in the specification and in the Inagaki Declaration are not commensurate with the scope of the claims. Even if a showing of unexpected results were present, which is not conceded, the declaration and specification taken in combination provide only a single example with and a single example without polyolefin. These examples are provided at 45 parts by weight of the polyoxymethylene resin, and 55 and 40 parts by weight of the block copolymer, respectively. The instantly claimed invention allows the content of polyoxymethylene resin to range from 10 to 99.5 parts by weight, and the content of the block copolymer and the olefin resin to range from 0.5 to 90 parts by weight, each. This is an extremely broad range, and the single point provided for each embodiment encompassed by Claim 1 (with or without olefin resin) does not show convincingly that there is any result that is observed consistently across applicant's entire claimed range.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Friday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Darcy D. LaClair
Examiner
Art Unit 1796

/DDL/

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